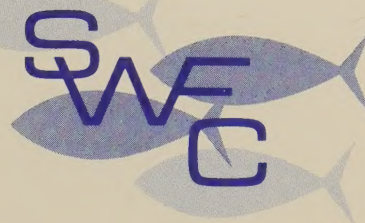




HONOLULU
LA JOLLA
MONTEREY
TIBURON



SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - OCTOBER 1983
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SOUTHWEST FISHERIES CENTER
LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - OCTOBER 1983

STATUS OF PUBLICATIONS

Published

Bartoo, Norman W. and Keith R. Parker. 1983. Stochastic age-frequency estimation using the von Bertalanffy growth equation. Fish. Bull., U.S. 81(1):91-96.

The method of estimating age frequency from length frequency via the von Bertalanffy growth equation is deterministic and yields biased results. Most of the bias can be removed by incorporating a stochastic element in the von Bertalanffy relationship. The stochastic element is based on estimated probabilities of lengths by intervals at age, the probabilities being estimated from variances in lengths-at-age. Based on age-length samples from the Pacific bonito fishery the stochastic method gives improved age-frequency estimates over those obtained by the deterministic method. The stochastic application may be generalized to all growth models including discontinuous growth such as in crustaceans.

McLain, Douglas R. and David H. Thomas. 1983. Year-to-year fluctuations of the California Countercurrent and effects on marine organisms. Calif. Coop. Oceanic Fish. Invest. Rep. 24:165-181.

Moffitt, Robert B. 1983. Heterocarpus longirostris MacGilchrist from the Northern Mariana Islands. Fish. Bull., U.S. 81(2):434-436.

Moser, Mike, Jeannette Whipple, Judy Sakanari and Carol Reilly. 1983. Protandrous hermaphroditism in striped bass from Coos Bay, Oregon. Trans. Am. Fish. Soc. 112:567-569.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Eleven of 42 adult striped bass collected from Coos Bay, Oregon, were possibly protandrous. The older hermaphrodites, ages 7 to 10 years, showed increasing signs of pathology associated with egg retention.

Approved by Center Director

DeMaster, Douglas P. A review of density dependence in marine mammals. For publication in Bering Sea Ecosystem Workshop papers.

Deutsch, Charles J., Ruth Ittner and Gail A. Peiterson. Mother-pup behavior and movements in the Hawaiian monk seal, Monachus schauinslandi. (Abstr.) Proceedings, the Fifth Biennial Conference on the Biology of Marine Mammals, Boston, MA, November 27-December 2, 1983.

Guillemot, P.J., R.J. Larson and W.H. Lenarz. Seasonal cycles of fat and gonad volume in five species of northern California rockfish (Scorpaenidae: Sebastes). Submitted to Fish. Bull., U.S.

Hewitt, Roger P. Reaction of dolphins to a survey vessel. For consideration for publication in Fish. Bull., U.S.

Hochachka, P.W., R.W. Brill, B. Emmett, C. Daxboeck, S. Perry and T.W. Moon. Lactate exchange at the central vascular rete in tuna. Science (Wash., D.C.).

Kaupp, Sandor E. On the comparative sensitivity and evolution of resistance to ultraviolet radiation in marine fish larvae. For consideration for publication in Photochemistry and Photobiology.

MacFarlane, R. Bruce. Determination of corticosteroids in fish plasma by high performance liquid chromatography: Evaluation of the method using striped bass (Morone saxatilis). Submitted to Can. J. Fish. Aquat. Sci.

Smith, Paul E. Year-class strength and survival of '0'-group clupeoids. For consideration for publication in the Can. J. Fish. Aquat. Sci.

Administrative Reports

Balazs, George. 1983. Status review document for Pacific sea turtles. SWFC Admin. Rep. H-83-15.

Kuljis, Barbara A. 1983. Porpoise/fisheries interactions within the Hawaiian Islands. SWFC Admin. Rep. H-83-19C.

CIC Research, Inc. 1983. A fishery data collection system: Saipan.
SWFC Admin. Rep. H-83-20C.

_____. 1983. A fishery data collection system: Guam. SWFC
Admin. Rep. H-83-21C.

Cooper, James C. and Samuel G. Pooley. 1983. Characteristics of
Hawaii's wholesale seafood market. SWFC Admin. Rep. H-83-22.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Dives Made at Johnston Atoll in Research Submersible

Dr. Jeffrey J. Polovina, Leader, Resources Assessment Investigation of the Mariana Archipelago (RAIOMA) Program, reports that Dr. Stephen Ralston and Reginald M. Gooding, Fishery Biologists, completed a series of 10 dives totaling 40 h of bottom time at Johnston Atoll in the research submersible Makalii. The Makalii is owned by the University of Hawaii (UH) and is operated through the National Undersea Research Program, a branch of NOAA. Also collaborating with Ralston and Gooding was Gerald Ludwig of the U.S. Fish and Wildlife Service (USFWS), Honolulu. The purpose of the dives was to examine the abundance and spatial dispersion patterns of the deepwater (120-360 m) bottom fishes surrounding the entire atoll. The complete perimeter of the 182 n.mi. (33% of the atoll) was surveyed during the 10 dives, which included visits to all exposures of the atoll.

Based upon preliminary analyses of the video and voice tapes, it is clear that the deep slope bottom fishes (mainly lutjanids, serranids, and carangids) are highly clumped or patchy in vertical and horizontal distribution. The observers used the Makalii as a quadrat sampler, and based on quantitative counts, it is apparent that two distinct peaks occur in abundance with depth, one at 180 m and another at 260 m. The latter peak was coincident with an abrupt thermal discontinuity in the water column (a second thermocline) where water temperatures dropped precipitously from 15° to 11° C over a vertical span of little more than 20 m. Very few commercial species were observed below 275 m although detailed depth distribution data were gathered for some 48 species throughout the depth range of the study. The angle of the slope, invertebrate communities, and geological structure were also studied and characterized along vertical transects of the submersible.

In addition to vertical stratification, Ralston and Gooding examined factors affecting abundance patterns along horizontal gradients. Shelter availability and bottom topography seemed to be a key factor here as were currents and exposure to prevailing surface weather conditions.

Later this month, the NOAA ship Townsend Cromwell will stop at Johnston Atoll enroute to Guam. During a 3-day stay, the scientific staff of the Cromwell will fish for bottom fish. From the data gathered, an attempt will be made to relate bottom fish abundance as determined from Cromwell catch rates, to abundance, as estimated during visual transects in the Makalii.

Plans Made for Seamount Survey
Around the Mariana Archipelago

Richard N. Uchida, Leader, Insular Ecosystem Program, completed the preliminary cruise instructions for cruise TC-84-03 of the Townsend Cromwell. The cruise is scheduled for March 9-April 4, 1984, and will involve fishery exploration and observations on physical and biological variables over and around the western North Pacific seamounts located within the fishery conservation zone around the Mariana Archipelago. Uchida said that the objectives of the cruise are to conduct hydrographic surveys over and around the seamounts, conduct exploratory fishing with bottom trawl, handline, and traps for pelagic armorhead, alfonsin, and other seamount species, make XBT and CTD casts, plankton, and midwater trawl tows in the seamount area, conduct coral drags over the summits and on the slopes of the seamounts, and conduct squid jigging in waters of the Mariana Archipelago. During the cruise, the Cromwell will make a port call at Shimizu, Japan, where members of the scientific field party will participate in a 3-day seamount workshop cosponsored by the Honolulu Laboratory, the Far Seas Fisheries Research Laboratory, and the Japanese Society of Fisheries Oceanography.

* * * * *

Reginald Gooding revised a manuscript, "Predation on surface and bottom released spiny lobster, Panulirus marginatus, in the Northwestern Hawaiian Islands," and sent another manuscript "Trapping for the deepwater caridean shrimps, Heterocarpus laevigatus and H. ensifer, in the Northeastern Hawaiian Islands," to outside reviewers.

* * * * *

Research Assistant Michael P. Seki sorted Cobb trawl samples collected on the NOAA ship Townsend Cromwell during cruise 83-03 into major groups and identified the squids in the samples. Squids in the Families Enoploteuthidae, Onychoteuthidae, and Gonatidae made up the bulk of the collection. Seki identified or verified the identity of squids taken at night-light and jigging stations on cruise 83-02 of the Cromwell. Nearly all were ommastrephids.

Seki also began a search of the literature for information on the diets of seabirds and tunas, the density of seabirds in relation to distance from land, and the relation of the distribution of bird flocks and the central Pacific current systems. The material will be used for a manuscript being prepared by Craig Harrison (formerly with the USFWS), Laboratory Director Richard S. Shomura, and Seki on tropical seabird and fisheries interactions.

PELAGIC RESOURCES INVESTIGATION

Highly Successful Tracking of Yellowfin Tuna Completed

Dr. Richard W. Brill, Leader, Experimental Ecology of Tunas Program, reports that Dr. Kim Holland, Hawaii Institute of Marine Biology, Lt. (jg) Scott Ferguson, NOAA Corps, Randolph K. C. Chang, Fishery Biologist, and research assistant Lance S. Asagi participated in a highly successful track of a 70-cm fork length (FL) yellowfin tuna, Thunnus albacares, off Waianae, Oahu, on the Honolulu Laboratory's research vessel, Kaahale'ale. This work is part of a project to determine the short term horizontal and vertical movements of tunas around fish aggregating devices (FAD's).

The fish was caught near the 91-m (50-fm) isobath a few miles off the coast at 9:55 a.m. on October 7. An ultrasonic depth sensitive transmitter with a 12-day battery was attached to the fish, and on the initial track, the fish was followed for 26 h, until it was lost directly off Kaena Point. After returning to Waianae Boat Harbor for refueling and to allow the crew to rest, the Kaahale'ale returned to Kaena Point about 12 noon on October 9. The fish was relocated and tracked until the following morning (October 10) when it returned to the vicinity where it was originally caught.

After the Kaahale'ale returned to the Waianae Boat Harbor to refuel and exchange crews, a search for the fish was resumed late in the afternoon of October 12. The was again relocated near the Kaena Point-Makus vicinity and was tracked until the following morning when it again returned to the inshore area near the 91-m isobath where it was originally caught.

The vessel was forced to return to Kewalo Basin on October 13 because of the threat of hurricane Raymond. An attempt to relocate the fish was made October 19. Unfortunately the transmitter had apparently been shed and was lying on the bottom near the 109-m (60-fm) isobath in an area off the coast between Keaau and Kepuli Points.

This very successful mission resulted in three prolonged tracks spanning 6 days. Unprecedented data on a yellowfin tuna's horizontal and vertical movements were acquired, and the information obtained has significant implications with respect to the placement and effects of FAD's. This yellowfin tuna showed a predictable behavior pattern that allowed it to be repeatedly relocated for days after it was originally caught. The fish appeared to have a definite "home range" that included the inshore 91-m isobath. It made significant excursions offshore (well offshore of the present leeward Oahu FAD locations) but returned to the 91-m isobath area at about the same time every day. Also, rapid dives to over 700 m were recorded. These behavior patterns revealed motor, physiological, and navigational abilities that were previously suspected but undocumented.

The tracking equipment worked extremely well. In particular, the newly installed hydrophone fairing reduced water movement noise to the extent that excellent signal reception was possible at boat speeds of 6 to 7 knots.

FISHERY MANAGEMENT RESEARCH PROGRAM

Reports on Survey Design Projects Received

David C. Hamm, Computer Systems Analyst, received final reports from the contractor for the Guam Division of Aquatic and Wildlife Resources (DAWR) and the Commonwealth of the Northern Mariana Islands Division of Fish and Wildlife (DFW) survey design projects. The reports have been distributed as SWFC Administrative Reports H-83-21C and H-83-20C, respectively, and will serve as the foundation for improving the data collecting and processing systems for these islands. The DAWR has conducted creel surveys since the early 1970's but has never had a specific statistical design for their surveys. This study recommends several modifications to their present collecting methods that will improve the statistical validity of the data. The report also presents statistical formulae by which (1) the sample data may be expanded to estimate total island-wide catch and effort, and (2) confidence limits on these estimates may be determined. The DFW plans to field a similar creel survey and will use the contractor's report for Saipan as a guide for design and implementation of their survey.

In support of the DAWR and DFW creel surveys, Hamm and Todd Kassman, Computer Clerk, have begun designing and programming the expansion system on the Apple microcomputer. Monthly estimates of total catch by gear, total effort, and species composition will be made.

Samuel G. Pooley, Industry Economist, reports that the Honolulu Laboratory's research on seafood marketing in Hawaii was discussed at meetings of the Governor's Committee on Aquaculture and at a local fishery economists' group. Pooley also reports that the final report on the retail seafood marketing survey was received from the contractor. This report includes species composition and county extrapolations. Receipt of this report concludes the baseline work on these markets.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

Egg Production Sample Error Distribution Model Completed

Dr. Paul E. Smith, Fishery Biologist and Leader of the Survey Systems Task, has completed the empirical description of the abundance of eggs as a function of time, the changing degree of contagion, and the use of Monte Carlo techniques in order to examine the consequences of changing the number of samples used to estimate egg production and survival.

The model has two components: the exponential decline in numbers of eggs with time and the linear increase in the contagion parameter of the negative binomial with time. The equations use all the observations of anchovy eggs taken since 1980 ($N = 1666$). The exponential equation of egg abundance as a function of time is

$$\begin{aligned} M &= a * \exp(bt) \\ &= 12.935 * \exp(-0.009717 * t). \end{aligned}$$

The linear increase in the contagion parameter of the negative binomial distribution is

$$\begin{aligned} k &= a + bt \\ &= 0.213 + (0.0050 + t) \end{aligned}$$

where t is the time in hours since hatching.

Figure 1 shows the distribution of abundance estimation of 200 samples of 500 observations for each of four egg ages; 0, 24, 48, and 72 hours. The line is the calculated-mortality curve.

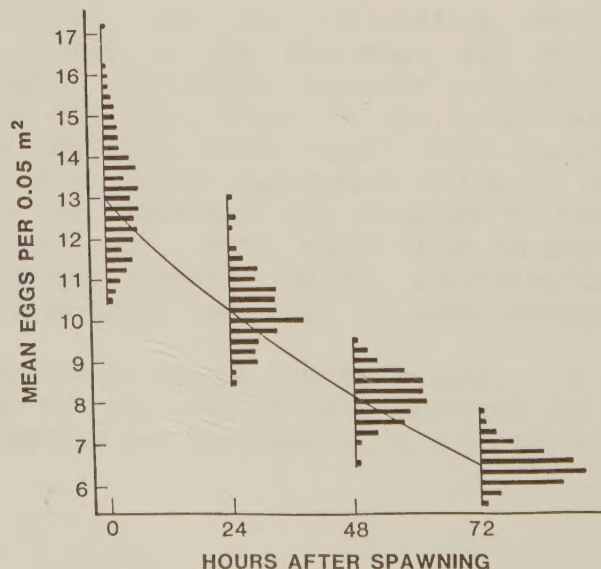
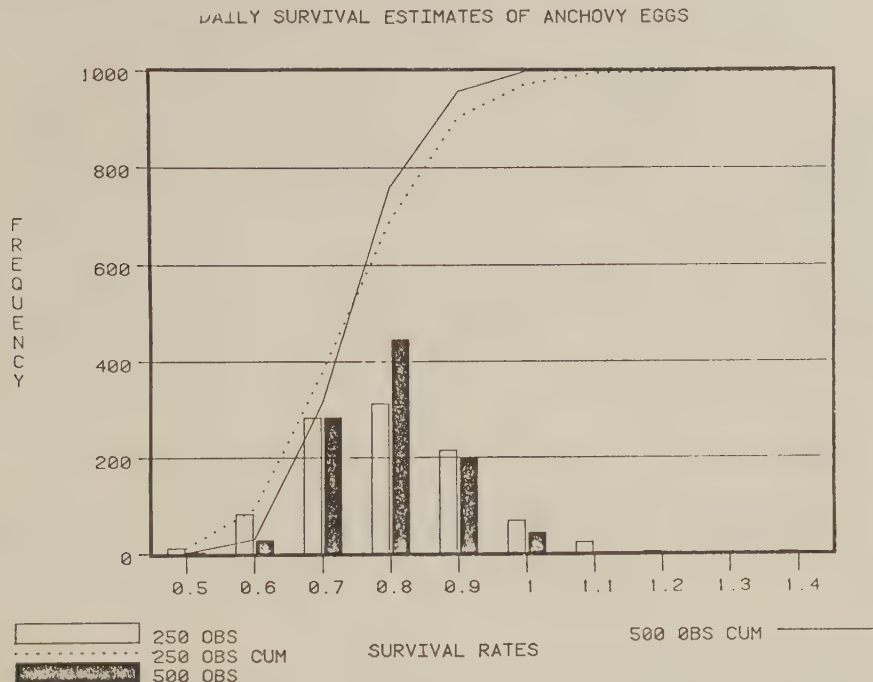


Figure 2 illustrates the consequences of estimating survival from 250 and 500 observations.



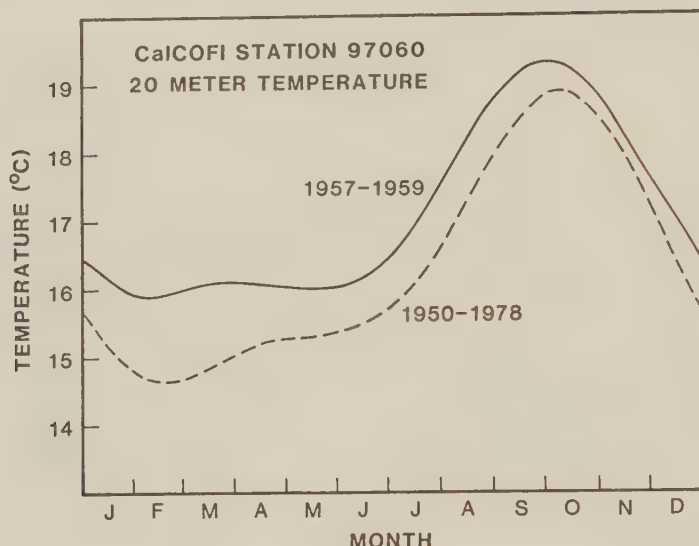
These results may be used to improve the efficiency of the SWFC egg-production method for anchovies and to establish objectives for fish species in other regions, with different parameters of distribution and dispersion.

Harmonic Analysis Program for CalCOFI Oceanographic Data Implemented on VAX

As part of an ongoing effort to convert CalCOFI data retrieval and utility programs for the Burroughs B78W computer to the VAX-11/780, oceanographer Larry Eber has completed a PASCAL version of the harmonic coefficient fitting procedure. The method was first applied to CalCOFI station data by Ron Lynn (CalCOFI Reports, Vol. XI, 1967), and involves fitting the annual and semiannual harmonics to observed data by regression analysis. The result is a set of five coefficients for each data parameter for each depth at each station, from which the seasonal cycle can be computed.

An example is given in the accompanying graph which shows two seasonal curves of 20 m temperature at station 60 on line 97. The lower curve is based

on 87 cruises which represents all of the data presently available for this station in the oceanic data file. The upper curve is based on 19 cruises during the warm year, 1957-1959.



Dr. Alvariño Teaches Zooplankton Course to Students at the University of Merida, Mexico

Dr. Angeles Alvariño, Fishery Biologist, returned from a month's stay at the Center for Research and Advanced Studies (Centro de Investigacion y de Estudios Avanzados, Unidad Merida) of the National Polytechnic Institute of Mexico. She presented a course on zooplankton, ocean dynamics, and fisheries to 23 graduate students and Master's degree candidates. The students' background ranged from biologist to engineers in chemistry, biochemistry, and molecular biology.

The plankton collections used in the class were collected along nine transects over the continental shelf of the Yucatan peninsula, extending in some cases beyond the edge of the shelf.

Analysis Conducted to Intercalibrate Laboratory and Field Measurements of Young Mackerel

As part of a study to evaluate factors which affect the survival of young fish, fishery biologist Gail Theilacker is determining the nutritional condition of jack mackerel larvae collected at sea. One of the techniques she uses to estimate the incidence of starvation relies on identifying changes in larval morphology. Five body measurements are taken and the combination of these measurements is used to predict larval condition. The technique was developed using measurements of fish reared in the laboratory. In order to apply factors derived from the measurements of laboratory-reared fish to

mackerel sampled in the field, adjustments are required. It has been shown, for example, that both handling and preservation cause shrinkage of young fishes, and the amount of shrinkage varies among their body parts. Final fish size is dependent not only on initial size but also on the handling time (which differs between the laboratory and the field) and the type of preservative used (Theilacker, 1980).

Theilacker reports that experiments designed to intercalibrate laboratory and field measurements of mackerel were analyzed this month. In these experiments, field conditions were simulated by circulating sea water over a measured fish confined in a net for 30 minutes and then remeasuring it four more times at intervals of 5-7 minutes. Standard length, head length, eye diameter, and body depth at the anus were measured. Final preservation was made either in Bouin's fixative (used for histological analyses) or in formalin (as per shipboard procedures). Jack Metoyer, Biological Technician, assisted with these shrinkage experiments.

The mackerel in this study ranged between 3.25 and 4.10 mm standard length, and this restricted length group showed no trend between shrinkage and size. For the shrinkage analyses, all mackerel were combined into one group. In the combined size group, length of the mackerel body and the head continued to shrink for the duration of the net treatment. The width of the body and the eye shrank initially with no further change in either with additional treatment.

A multivariate analysis was used to predict the ratio of net-treated size to live size from the treatment time. Because individual shrinkage was highly variable (e.g. shrinkage of body depth varied between 0 and 23% for treatment times between 5 and 20 minutes) the regression correlations were poor ($R^2 = < 0.67$). However, since these are the best estimates for average shrinkage of body parts, the regressions were used to calculate the adjustment factors needed for this study. Factors for each body part (R_8 ; Table following) were calculated by combining the shrinkage ratio at 8 minutes (average elapsed time for these field collections) with the average shrinkage with shrinkage ratios for laboratory-sampled fish (Theilacker, 1980). Size of sea-caught mackerel will be adjusted with these factors to equate their size to laboratory-preserved mackerel. The laboratory-developed morphometric technique can then be used to identify the condition of sea-caught mackerel.

Also given in the table are average shrinkage ratios (R_2 , R_3 , R_4) calculated for specified time intervals and the average shrinkage in formalin after net treatment. Mackerel shrinkage was greater in Bouin's than in formalin, results which are consistent with studies on northern anchovy (Theilacker, 1980). Also, as with anchovy, formalin preservation caused a slight increase in the size of the mackerel eye (see following table).

SHRINKAGE OF JACK MACKEREL LARVAE

Treatment Ratio (R) is Treated Size Divided by Previous Size (1.00 = No Shrinkage)

Treatment Ratio	R	n	Mean Time	RATIOS			
				Standard Length	Head Length	Eye Diameter	Body Depth
8 min Net Live Size	R_1^2	89	8	.93	.90	.91	.89
5-10 min Net Live Size	R_2	36	7.3	.94	.90	.92	.89
11-15 min Net Live Size	R_3	22	126 λ	.87	.88	.88	.86
16-28 min Net Live Size	R_4	27	19.4	.81	.86	.89	.88
Bouin's Fixative Net-treated Size	R_5^3	15	--	.91	.84	.93	.91
Formalin Fixative Net-treated Size	R_6^3	13	--	.96	.93	1.08	.91
Laboratory-Preserved in Bouin's Fixative Live Size	R_7^4	45	--	.92	.82	.90	.75
Calibration Factor							
R_7	R_8^5	--	--	1.09	1.08	1.06	.93
$R_1 \times R_5$							

¹Range in standard length 3.25 - 4.10 mm.

²Calculated from regression.

³Shrinkage in fixative after net treatment.

⁴Data from Theilacker (1980).

⁵Adjustment factor to equate measurements of field-collected mackerel with measurements of laboratory-raised mackerel (Theilacker 1978; 81).

Staff of the Southwest Fisheries Center are Major Contributors at the 1983 Annual CalCOFI Conference

The staff of the Southwest Fisheries Center contributed 32% of the papers and poster sessions given at the annual California Cooperative Oceanic Fisheries Investigations Conference held October 24-27 at the USC Conference Center in Idyllwild, California. The presentations covered a wide range of CalCOFI-related topics.

Among the poster precis were the following:

- "Sardine recovery?" by Paul E. Smith and C. Santos.
- "Rates of follicular atresia in captive and wild northern anchovy (Engraulis mordax)" by John R. Hunter and Beverly J. Macewicz.
- "Birthdate distributions of recruit anchovies" by John Butler and Richard Methot, Jr.
- "Anchovy spawning off southern California during El Niño, 1983" by Paul Fiedler.
- "California Department of Fish and Game, National Marine Fisheries Service wetfish data-bases" by Donna Mallicoate and Richard Parrish.

The formal papers presented by SWFC staff included the following:

- "U.S. fisheries along the Pacific west coast and the recent El Niño" by R. Michael Laurs and Ron Dotson.
- "The spectral sensitivity and irradiance threshold of first-feeding larval northern anchovy, Engraulis mordax" by John Hunter and Sandor Kaupp.
- "The biological basis for the anchovy fishery management plan" by Richard Methot and Alec MacCall.
- "Comparison of the mortality and dispersal of sardine and anchovy eggs off Peru" by Paul Smith, H. Santander and J. Alheit.
- "Embryogeny and field time course of the anchovy egg" by Nancy Lo, Geoffrey Moser and Paul Smith.
- "Visual threshold for schooling in northern anchovy, Engraulis mordax" by John Hunter and Raga Nicholl.
- "A model of the drift of larval anchovy (Engraulis mordax) in the California Current" by Jim Power.

"The effect of transport on estimation of local anchovy egg mortality rates" by Alec MacCall and Jim Power.

"A geographic map of anchovy spawning habitat quality" by Alec MacCall.

"Possible environmental influences on Dungeness crab recruitment" by D. Johnson, L. Botsford and Richard Methot, Jr.

"An evaluation of California sea lion scats as indicators of prey importance" by Mark Lowry.

"Annual consumption of northern elephant seals and California sea lions in the California Current" by Douglas DeMaster.

"Survival of young jack mackerel in different environments" by Gail Theilacker.

"Evidence for a fall spawning anchovy stock" by Richard Parrish.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Fifth Draft of Anchovy Fishery Management Plan Prepared

A fifth draft of the revised Anchovy Fishery Management Plan has been prepared by Drs. Alec MacCall and Richard Methot of the Anchovy Plan Development Team with assistance from industry economist Cindy Thomson and Jay Ginter of the Southwest Region. This draft incorporates the management options recommended by the Pacific Fishery Management Council and expands the analysis in the Regulatory Impact Review. Thomson incorporated the required net benefit analysis of the Council's recommendations versus the alternatives considered. Copies are being prepared by the Pacific Fishery Management Council for review by NMFS in Washington, D.C.

Recreational Fishery Economics Research to be Carried Out Under Contract

Dr. Huppert and Cindy Thomson met at La Jolla with Dr. R. Rowe, Principal Investigator with Energy and Resource Consultants, Inc. of Boulder, Colorado, to outline the recreational fisheries demand models to be produced by Dr. Rowe during his work contract with the SWFC during the next several months. Agreements were reached regarding geographical and species groupings, placing first emphasis on California data, and next meeting time. One difficulty that has delayed more visible progress on the study is obtaining access to NMFS survey data. Dr. Huppert now believes, however, that most problems have been resolved so that work on quantitative analysis can now begin in earnest.

As an adjunct to the contract study of Pacific Coast recreational fisheries, Huppert and Thomson are reworking the partyboat angler survey data base collected in 1979-80 in order to provide comparative results for some areas and fishing modes. For each of seven designated fishing areas, Thomson has estimated logit models which explain the probability of an individual being a marine recreational fisherman. The model consists of a regression equation with income and travel time as explanatory variables. Different measures of income (family, household, and per capita) and dollar valuations of travel time as well as travel time itself were included in various combinations in these regression equations. In all equations for all fishing areas, income had a negative and statistically significant effect on participation. Although the correlation between travel distance and time tended to obscure the separate effects of these two variables, they also tended to affect probability of participation negatively. The next step will be to estimate average number of trips per year per angler in all seven fishing areas to travel cost and travel time. Because error variances are expected to differ among observations in this application, variances of the dependent variables were calculated via SPSS for each geographic area and all fishing areas, and entered manually into the appropriate data files. These variances will be used to obtain Weighted Least Squares estimate of the appropriate regression equation.

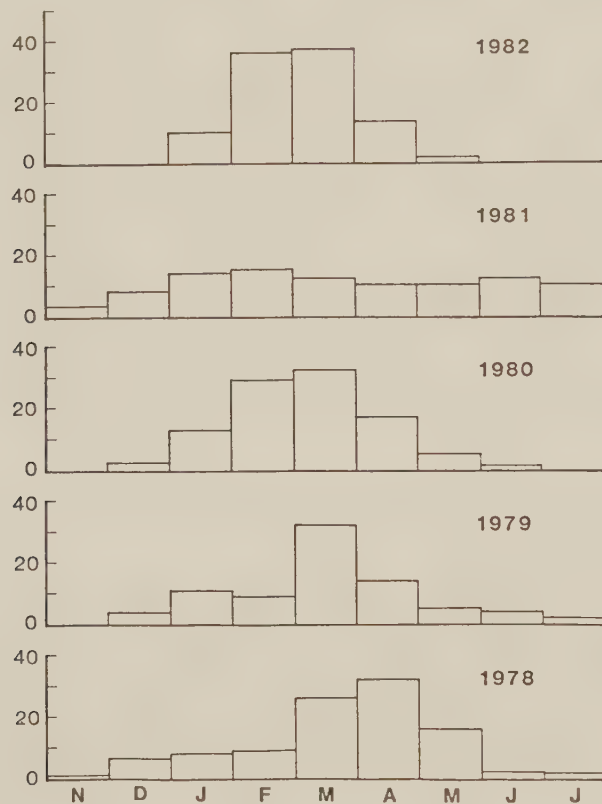
Relationship of Birthdate and Age Determined for 1982 Anchovy Year Class

Fishery biologist John Butler and laboratory assistant Susan Longinotti, UCSD, have completed ageing the 1982 anchovy recruits. From the date of capture, age and length of the 195 anchovy recruits, Butler has determined the relationship of birthdate and age for the 1982 year class. This relationship was used to construct a stochastic length birthdate key using the technique of Parker and Bartoo (1983). This key was then applied to a weighted length-frequency distribution provided by fishery biologist Richard Methot. The result is a composite birthdate distribution of the 1982 year class based on the length birthdate key and the results of the 1982 young-fish survey conducted by Ken Mais of the California Department of Fish and Game. The composite birthdate distribution is representative of anchovy recruits from the U.S. Border to Point Conception.

The 1982 birthdate distribution indicates that most (approximately 60%) of the recruitment during 1982 came from fish spawned in March and April. The shape of the distribution is similar to the years 1978-80 and is also similar to the long term average distribution of anchovy spawning (Lasker and Smith, 1977). If egg production in 1982 was similar to the long term mean, then the 1982 year class was not subjected to size specific or seasonal effects on mortality.

The 1981 birthdate distribution was unique in that spring-spawned fish did not dominate recruitment and significant recruitment came from May and June. The 1981 year class was a failure for the northern anchovy. Poor

recruitment in 1982 may have been the result of size specific predation or environmental factors which were persistent during the peak spawning season of the northern anchovy. Comparing birthdate distributions from 5 years indicates that good year classes result from recruitment from the peak spawning season while poor year classes result from failure during that period.



Birthdate distribution of juvenile northern anchovy (1978-1982)

Oceanic Fisheries Resources Division

TUNA AND BILLFISH RESOURCES PROGRAM

SWFC Scientists Attend Annual ICCAT Meeting in Spain

In connection with the annual meeting of the International Commission for the Conservation of Atlantic Tunas (ICCAT) to which the U.S. is signatory,

fishery biologists Drs. Norman Bartoo, Pierre Klieber, and Gary Sakagawa traveled to Madrid, Spain October 29-November 11 to meet with their foreign counterparts of the Standing Committee on Research and Statistics (SCRS) of ICCAT. Nine papers, ranging from a review of U.S. fisheries of the Atlantic Ocean for 1982-83 to an analysis of the International Skipjack Year Programme skipjack tagging results were submitted by Center scientists.

Status of Atlantic Tuna Fishery Sampling Program

Foreign-caught Atlantic tunas transshipped to Puerto Rico are sampled routinely for biological information by biological technician Eugene Holzapfel. Data on fork length, weight, and species composition of catches are collected. Of the 92 samples taken in 1983, 80 are from the eastern Atlantic (off the coast of Africa) and 12 are from the western Atlantic. Results of Holzapfel's sampling during the period January 1 to October 31, 1983 are as follows:

Species and gear	Number of samples	Number of fish samples	Tonnage sampled (mt)
Yellowfin			
Purse seine	16	1068	523.0
Baitboat	21	1622	267.7
Longline	1	71	1.1
Unknown	10	705	167.1
Skipjack			
Purse seine	8	406	2055.2
Baitboat	9	451	1026.9
Unknown	2	101	117.0
Bigeye			
Purse seine	12	402	278.4
Baitboat	2	69	1.0
Unknown	6	162	47.9
Albacore			
Longline	2	100	1262.6
Blackfin			
Baitboat	2	100	13.3
Bullet tuna			
Purse seine	1	50	180.3

During the period of January 1 to October 31, 1983, 19 size composition samples were collected for the Multi-species Data Management and Fisheries Monitoring Program by the Inter-American Tropical Tuna Commission. These data

were collected from four foreign purse seiners that fished in the Caribbean Sea and transshipped their catches to Puerto Rico. A summary of these data follows:

Species	Trips sampled	Number of samples	Number of fish sampled
Yellowfin	5	8	400
Skipjack	5	7	352
Blackfin	3	3	109
Bigeye	1	1	4

MARINE MAMMAL BIOLOGY PROGRAM

IWC Working Group Meets at the SWFC to Develop Research Proposals for the FAO/UNEP Global Plan of Action

The United Nations Environment Programme (UNEP) contracted with the International Whaling Commission (IWC) to convene and organize a meeting to develop research proposals for the utilization of \$3 million for work on large cetaceans and \$3 million for small cetaceans over a 2-year period.

The IWC Scientific Committee prepared a list of experts to undertake this assignment. The following group met under the chairmanship of Dr. G. P. Kirkwood, Commonwealth, Scientific and Industrial Research Organization (CSIRO), by invitation, at the SWFC from October 31 to November 3, 1983:

- K. R. Allen, UNEP
- J. L. Bannister, Western Australian Museum
- R. Bastida, National Fisheries Research and Development, Argentina
- P. B. Best, Sea Fisheries Branch, Marine Mammal Laboratory,
Capetown, South Africa
- H. W. Braham, NMFS
- R. L. Brownell, Jr., U.S. Fish and Wildlife Service
- R. Gambell, IWC
- J. Gulland, FAO
- T. Kasuya, Far Seas Fisheries Research Laboratory, Japan
- G. P. Kirkwood, CSIRO
- S. Ohsumi, Far Seas Fisheries Research Laboratory, Japan
- R. S. Payne, New York Zoological Society
- W. F. Perrin, SWFC
- C. J. Røvik, Institute of Marine Research, Norway



Following their deliberations, members of the IWC Working Group pose on the lawn at the Southwest Fisheries Center. Kneeling in the foreground is S. Ohsumi. From left to right: Ruth Miller who handled the details of the meeting arrangements, Howard Braham, John Gulland, J. L. Bannister, Geoffrey Kirkwood, William Perrin, Peter Best, Robert Brownell, Roger Payne, Ray Gambell, T. Kasuya, E. Rørvik, R. Bastida, and K. Radway Allen.

Research proposals had previously been solicited from the members of the IWC Scientific Committee, and some unsolicited proposals were also available. The working group also considered research proposals included in previous international programs and meetings. Research needs were discussed separately for small and large cetaceans.

Using information from these various sources, the Working Group identified 26 situations in which the conservation and management of the small cetaceans involved would clearly be served by research. Given very high priority was research on the distribution and status of the Indus susu, Platanista indi, in Pakistan; research on the status of the harbor porpoise, Phocoena phocoena, in the North Sea, English Channel and Baltic Sea; research on the distribution and status of the cochito, Phocoena sinus, in the Gulf of Mexico; research on the distribution and status of the black dolphin,

Cephalorhynchus eutropia, in Chile; research on the status of black sea dolphins and porpoises; review of by-catch of small cetaceans in gillnet fisheries; estimation of incidental kill of dolphins in the Mexican tuna purse-seine fishery in the eastern tropical Pacific; and research on marine mammal-fishery interactions in waters off Sri Lanka. Fourteen other proposals were given high priority designations and four were given medium priority status.

Before attempting to draw up a set of specific research proposals for the large cetaceans, the Working Group first undertook an objective review and developed a set of priority research needs, identifying those areas in which research is most urgently required. Three general categories of research needs were identified: (1) heavily depleted stocks, which are currently or potentially under threat and on which research is urgently needed; (2) critical questions for conservation of large whales; and (3) new techniques requiring development.

Heavily depleted stocks were subdivided into two categories: (1) stocks that have been heavily depleted and for which there is an immediate threat to recovery - western Arctic bowhead, western north Atlantic right, and western north Atlantic humpback; and (2) stocks that have been heavily depleted and for which there is a potential threat to recovery - eastern Canadian bowhead, western North Pacific right, peninsula Valdes right, western and eastern north Pacific humpback, and the Antarctic stocks (blue, fin, sei, and humpback). In developing this list, the Working Group considered only those stocks for which it believed a realistic research proposal could be developed.

In addition to research needs for specific threatened stocks, a number of critical research areas of wider scope were identified. In this category are included studies of the effects of environmental degradation, particularly on severely depleted stocks; questions related to the viability and rate of recovery of depleted stocks and stock identity. The effects of the development of a krill fishery on the recovery of depleted stocks of balaenopterids in the Southern Ocean was felt to be a research area of particular importance.

Recognizing that it will be no longer possible to rely on the continued availability of data from commercial whaling operations, a number of new sampling techniques of a benign or low-consumptive nature need to be developed.

Age Estimates Made for Sample of Pacific Bottlenose Dolphins

Dr. Al Myrick, Marine Mammal Biology Program, and Beth Hacker, under contract to SWFC, have completed estimating ages from teeth of some 160 bottlenose dolphins collected from the Pacific (mostly from the California and Baja California coast). Prior to carrying out the tooth readings, Hacker spent several months learning the tooth sectioning and staining techniques, developed by Myrick's lab for other dolphin species, and modifying it for use on the bottlenose dolphin specimens.

After preparation of tooth thin sections, Hacker and Myrick made independent age estimates of each specimen, following a reading method calibrated from tetracycline-labeled bottlenose dolphins by Myrick. Between-reader age estimate comparisons showed that 88% were within preset scaled limits of acceptability. Among the specimens, ages ranged from 0 to 49 years old. Analyses of age-specific growth rates and age composition for the sample are proceeding. A report of the results will be completed shortly.

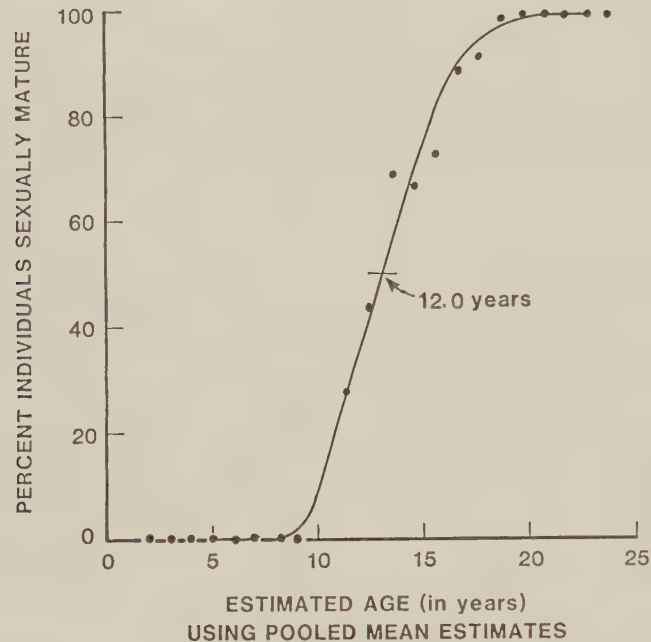
Three Papers on Spotted Dolphin Reproduction Completed

Three papers describing a variety of reproductive parameters in female spotted dolphins were completed in October using reproductive data gathered from specimens collected from 1973-82 as incidental kills in the tuna purse-seine fishery.

Dr. Jay Barlow completed work on a manuscript entitled "Variability, trends, and biases in spotted dolphin reproductive rates". His paper examines the biases inherent in sampling methods, the annual variability in reproductive rates, and whether any long term trends can be detected in females reproductive parameters. The fractions of female dolphins that were pregnant and were lactating were robust to sampling conditions and were regarded as showing little bias. In contrast to previous studies, percent pregnant was not found to change significantly from 1973-82, though annual variability was large. The percent lactating increased during this time period. Barlow speculates that the increase in lactation period may have been caused by a reduction in fishing-related calf mortality during the 1970's.

The second manuscript, "Reproduction in the female spotted dolphin, *Stenella attenuata*, from the eastern tropical Pacific" by A.C. Myrick, Jr., A.A. Hohn, J. Barlow, and P.A. Sloan, examined reproductive data from a sample of approximately 4700 female spotted dolphins collected from the eastern tropical Pacific from 1973-82. Two subsamples of the overall sample collected from 1973-78 and 1981 were aged and used to estimate age-specific rates for the northern offshore stock. Proportions of individuals in each reproductive state were similar in the overall and aged samples. The age-specific statistics for both aged subsamples were similar also. The youngest sexually mature was 10 years old; the oldest immature was 17; the youngest and oldest pregnant individuals were 10 and 35 respectively; the oldest individual was 38. There was high individual variability in the accumulation of corpora with age. Ovulation rate slowed abruptly after the eighth ovulation. Average age at attainment of sexual maturity (ASM) was 12 years (Figure 1); the authors found no significant temporal change in ASM's using comparisons of samples taken in heavy-mortality and light-mortality years. A strong correlation found between color phase and state of sexual maturity suggests that color phase may indicate maturity more accurately than either age or length. The average annual pregnancy rate was approximately 0.33 for all samples combined. Analyses of age-specific pregnancy rates showed no sustained change in rate with age. The calving interval, estimated as the inverse of the pregnancy rate, was 3.06 years (s.e. = 0.116). The lactation period estimated from all samples was 1.7 years, but there was a significant increase in the percent lactating through time. This may be due in part to increased survival among

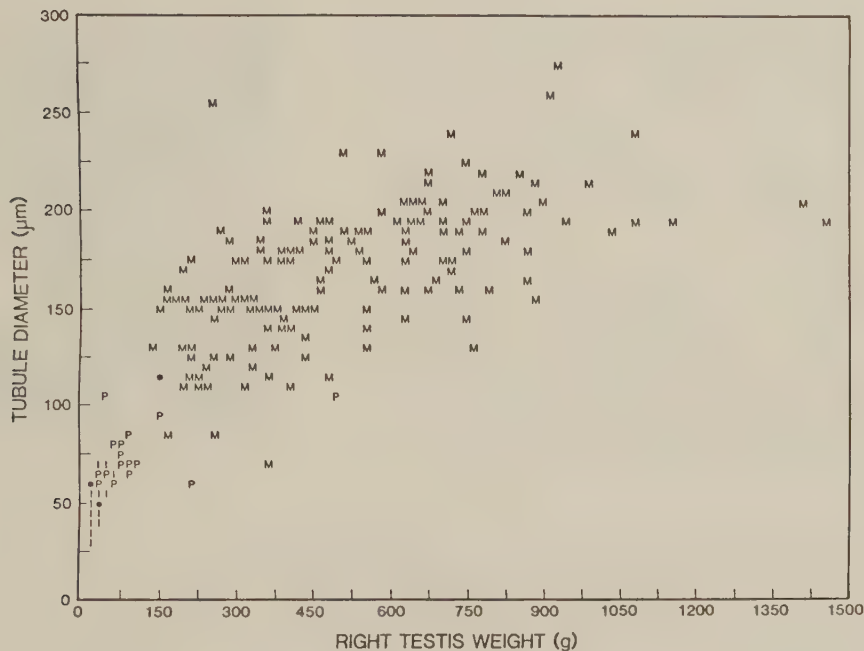
calves in recent years. Post-reproductive females were identified by their having atrophic ovaries or by lacking macroscopic follicles. The low percentage of senescent females found in the aged subsamples (0.4%) indicates that reproductive senescence may be of limited importance to vital-rates estimates for this stock.



The third paper, "Reproductive maturity and seasonality in male spotted dolphins" by A.A. Hohn, J. Barlow and S. Chivers gives estimates of the age at attainment of sexual maturity and identifies seasonality in reproductive condition in male spotted dolphins from the eastern tropical Pacific. Based on histological examination of testes, maturity state (immature, pubertal, or mature) was determined for each of 244 aged specimens from the northern offshore stock. These results were then used to estimate the age of sexual maturation using two methods: the median age at which 50% of the specimens were mature (based on a sigmoid fit to the percentage of specimens mature within each age class) and the mean age calculated using the formula of DeMaster (1978). The two resulting estimates, 15.5 and 16.5 years, respectively, are higher than previous estimates for spotted dolphins or other dolphin species.

Results from the histological analyses were used to develop non-histological criteria for defining maturity that could be applied to the entire sample of spotted dolphins collected from this stock. Testis weight was found to be an accurate indicator of maturity, where all but four specimens with a testis weight of 140 g or greater were mature (Figure 2). Color phase was also found to be correlated with maturity. All but one of the 163 mature specimens has a fused color pattern--that one was mottled; 82% of fused color

phase specimens were mature, while only 2% of mottled specimens and no specimens with neonatal, two-tone, or speckled color phases were mature. An index of testes lengths, was calculated for immature, pubertal, and mature specimens and found to provide an accurate measure of maturity. An index of this type may provide a means for determining and comparing maturity in other species, since testes weight alone is too variable for this purpose.



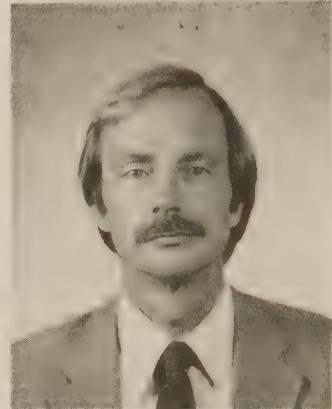
One prolonged peak in monthly mean testes weight and testis development index values was found, indicating one "season" in breeding condition. The maximum values occurred in July and August, midway between the two peak calving seasons for this stock.

The three manuscripts were sent to participants serving on the pre-SOPS panel of dolphin vital rates. The pre-SOPS panel will convene on November 3 to review the manuscripts formally.

PACIFIC ENVIRONMENTAL GROUP

OCEANOGRAPHER ANDY BAKUN SELECTED AS CHIEF, PACIFIC ENVIRONMENTAL GROUP

Andy Bakun has been selected as Chief of the Pacific Environmental Group in Monterey, California, it was announced this month by Dr. Izadore Barrett, Director of the Southwest Fisheries Center. Bakun has been a member of the PEG staff since 1970 where he has developed environmental index products, such as PEG's "Upwelling Index," a measure of the upward movement of colder nutrient-rich waters along the west coast of North America. This index has been widely used in studies of the effects of the environment on fisheries. Since 1977, Bakun has been the leader of the Fishery/Environmental Modeling and Forecasting Program at PEG.



Much of Bakun's early career in oceanography was spent at sea. From 1962-1965 he was a staff scientist on the famous research vessel, Anton Bruun, where he was in charge of chemical analysis and a member of the expedition diving team during the Indian Ocean Expedition, funded by the National Science Foundation. In 1968, he joined the then U.S. Bureau of Commercial Fisheries; Biological Laboratory in Seattle as a research oceanographer, serving as the field party chief on research cruises investigating the environment of salmon in the Gulf of Alaska and the Bering Sea.

Bakun graduated from the University of Washington with a B.S. in oceanography in 1962 and did graduate work in oceanography at the University of Washington (where he obtained a M.S. in 1968), and at Oregon State University.

The Pacific Environmental Group which Bakun will head is responsible for broadly-based programs of national scope in the field of fisheries oceanography. Its mission is to provide environmental information in support of biological and fishery programs at the NMFS fisheries research centers. The present research programs at PEG focus on ocean climatology, monitoring, modeling, and forecasting with emphasis on large scale events and ocean variability affecting living marine resources.

"We are fortunate in finding someone as well qualified as Andy Bakun to the Chief of PEG. Not only does he have first-hand knowledge of work at sea, but he has the academic background in oceanography and experience in fisheries science on the job," Dr. Barrett said.

Wind Stress Curl Seasonality Defined for Eastern Boundary Current Systems

At the Pacific Environmental Group in Monterey, California, PEG Chief Andrew Bakun and Commander Craig Nelson of the NOAA Corps have developed and mapped climatological fields of wind stress for the California, Peru, Canary, and Benguela Current systems on a smaller spatial scale than has previously been available. In the process previously unknown features on scales comparable to important pelagic fish spawning and feeding regions have been disclosed. Wind stress curls is the driving force for convergence or divergence of surface Ekman drift in the ocean, seaward of the primary coastal boundary region (approximately 10-20 km). It thus is involved in concentration and dilution or drifting organisms, and also influences the underlying ocean current patterns by altering the near-surface ocean stratification structure.

The results obtained by Bakun and Nelson indicate that positive wind stress curl (surface Ekman divergence) typifies the spawning regions of coastal pelagic fishes such as anchovies and sardines. An unexpected degree of conformity of curvature in the geostrophic flow field to the torque exerted by wind stress curl is also indicated. This would imply a tendency for cyclonic (anti-clockwise in the northern hemisphere) gyral flow patterns in these spawning regions, which may aid in the retention of eggs and larvae in the favorable coastal environment. Eastern oceanic dome structures, such as the Costa Rica, Guinea, and Angola domes appear to intensify during seasons when the overlying wind stress curl pattern is strongly cyclonic (divergent) and to relax when the curl pattern relaxes. These results have generated a set of promising hypotheses involving the use of interyear differences in the wind stress curl pattern to provide indices of interyear changes in larval retention, advection pattern, and food concentration processes.

Bakun noted that this work is an example of the use of interregional comparative studies to deduce linkages between environment and fish stock dynamics which may be much more difficult to investigate, experimentally or otherwise, in any single regional system.

Comparative studies are presently an important research component at PEG. It also illustrates another important aspect of PEG research, i.e., the attempt to develop ways to use more abundant and readily available atmospheric data to infer changes in the relatively poorly sampled ocean environment.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Nearshore Habitats at Santa Catalina Island Affected by High Water Temperatures

The nearshore habitats on Santa Catalina Island, Los Angeles County, show striking effects of water temperatures that have remained as high as 23°C for several months. This is the observation of investigation leader Dr. Edmund Hobson and fishery biologist Tony Chess, who this month completed the latest of a series of assessments of the flora and fauna that has spanned the past 10 years at that location. Accompanied by fishery biologist Dan Howard, they noted many unusual conditions at their regular study sites near Isthmus Cove, on the northern side of the island.

Among the more obvious differences from conditions seen earlier was the stunted condition of the giant kelp, Macrocystis pyrifera, which normally is the dominant feature in many nearshore areas. Typically, the giant kelp grows to the water's surface and forms a dense canopy, but at this time most plants had grown no more than 1 or 2 m above the sea floor (Figure 1), and were not visible from the surface.



Figure 1. A Tiburon biologist swims near stunted giant kelp, Macrocystis pyrifera, while examining effects of unusually warm water along a transect line at Santa Catalina Island.

Although fish species of certain tropical families or genera seem to be thriving on these conditions (Figure 2), species of certain temperate families--most strikingly, all of the surf perches and rockfishes of the genus Sebastes-- have largely left reefs that are in water up to 20 m deep. Many sessile invertebrates normally prominent on these reefs--notably the ascideans, sponges and bryozoans-- were virtually absent. This included the epiphytic bryozoan Membranipora, which normally encrusts the fronds of the giant kelp. At other times this organism has been the major prey of the labrid Oxyjulis californica, but in its absence this fish has adapted strictly planktivorous habits. A detailed account of present conditions in these habitats awaits analysis of samples of the microfauna that were collected.



Figure 2. The fish swimming about this Tiburon biologist are garibaldi, Hypsypops rubicundus. Like other species of tropical families and genera, the garibaldi has remained numerous and active on nearshore reefs, but certain species of temperate families have left.

UNDERUTILIZED FISHERY RESOURCES

Local Fisheries Development Notes

Fishery biologist Bill Leet collected a sample of large (11-12 inch) shortbelly rockfish, provided by a trawler from Half Moon Bay, and turned it over to a fish exporter who specializes in sales to Japan and Taiwan. Earlier export trials by the same broker did not elicit interest overseas. This time, however, the exporter thinks that the large size of the fish will surely meet with approval. The taste of shortbelly rockfish as fresh sashimi and as dried

and marinated products was excellent, according to him. If either of the recipients of the samples agrees that the fish merits a trial, a container load (18 tons) will be ordered from a local fish dealer this fall. One fisherman has obtained the special permit necessary to catch shortbelly rockfish.

Last month samples of ocean sunfish (*Mola mola*) fillet were supplied to three fish dealers, two of whom operate gourmet seafood restaurants. Task Leader Sus Kato reports that chefs at both restaurants gave mixed reviews on the possibility of using the fish in their menus. Both replies were similar: the fish has good characteristics (firm texture, good taste, 'shellfish-like') as well as bad (somewhat too chewy, hard to use in standard preparations of seafood). This year, ocean sunfish is abundant all the way to Washington, but commercial use is not likely to occur in the near future.

Another project placed on hold for the time being is the development of a small fishery for pelagic red crab, a species abundant off southern and central California during El Niño years. Salmon growers, potential users of the crab, decided to stick with feeding their salmon traditional sources of carotenoid pigments, mainly because of the temporary nature of the supply of red crabs. However, since the crabs contain a high concentration of the pigments and are a desirable salmon feed, the growers may change their minds at any time. A more discouraging note was presented by a pet food manufacturing firm which many years ago started using red crab in its line. It seems that pet food makers are turning more and more to beef and poultry products rather than fish protein sources, and little interest is evident in introduction of new ingredients.

The California sea urchin fishery was in turmoil this year because of numerous storms in southern California early in the year and the lack of good-quality urchins later. Divers thought that warm water and the storms either caused the urchins to stop feeding or destroyed preferred species of seaweed. Several processors quit packing sea urchin roe for much of the year. In early October, however, things began to change for the better. Roe yields increased considerably, as did prices in Japan for the roe. The latter was attributed to a shortage caused by a ban of imports of South Korean urchins into Japan, induced by a rash of food-poisoning cases due to contaminated Korean urchin roe. Prices to fishermen here nearly doubled within two weeks to \$0.25-0.30 per pound of urchin. Since each diver averages around 1500 pounds per day, he can quickly make up for the lean days experienced earlier in the year. The average size of harvested sea urchins appears to be significantly smaller now, so processors have had to increase efficiency or get higher prices (or both) to offset greater labor costs. Ten plants are now in operation in Los Angeles and Ventura counties, with a labor force of more than 400 workers. About 50 dive boats, mostly based at Santa Barbara and Oxnard, supply urchins to these plants.

FADs Appear to Hold Fish

Fishery biologist Bill Leet reports that although early reports have been scattered, it appears that the fish-aggregating devices (FADs) that were

deployed last June not only are holding aggregations of fish but are producing some catch. After the FADs were placed at the 43-Fathom Spot and at 60-Mile Bank off San Diego, log sheets were distributed to many fishermen's organizations and other representatives of fishing interests; thus far none has been mailed back. Nevertheless, a couple of letters from, and conversations with, people who have passed by the sites or fished at them indicate that the FADs are effective in doing what they are designed to do.

Latest report is that the FAD at 43-Fathom Spot is intact, as originally deployed. At least two striped marlin have been caught nearby and good signs of yellowfin and skipjack have been seen visually and with sonar.

The attracting raft of the 60-Mile Bank FAD was replaced in August after it disappeared. Although the new float was tethered to the mooring buoy with a steel cable it was also reported missing on August 18. With that report, however, came the information that there were aggregations of fish on the buoy.

The aggregating rafts, from which 60-foot lines woven with plastic tape "fronds" are suspended, are designed to be detachable so that they can be encircled by purse seine nets. However, that arrangement also makes their loss far more likely. On a happier note said Leet, it is encouraging that the mooring buoys are still in place, with the lights working.

FISHERIES INFORMATION AND AUTOMATIC DATA PROCESSING

CALFIN Update

During October several meetings were held with the staff of the Southwest Region (SWR) to discuss the status of the Pacific Area Cooperative Enforcement System (PACES). PACES is a cooperative enforcement system wherein a variety of enforcement and legal data is collected and processed among the Southwest Region, Southwest Fisheries Center, and the California Department of Fish and Game.

A new contract is being developed with the CF&G to reflect new user requirements and new computer equipment installed at the Long Beach office of CF&G to facilitate data entry and data retrieval by enforcement personnel.

John Davies, Computer Specialist stationed at the Southwest Region, has modified the cannery reports of the market news system so that when the tables are printed, a comparison of last year's figures with this year's figures for the same period will be presented. Steve Koplin of the Southwest Region is in the process of entering historical data so that within the next year the SW Center and Region will have a 5-year data base for tuna. These changes and improvements are directed toward the ultimate goal of producing the entire Market News Report from the computer.

Susan Iacometti, Computer Programmer, met with economist Dan Huppert and his staff this month on a price-setting policy for missing values in the PACFIN Fishery Research Information System (FRIS). She also discussed the PACFIN 1981 data processing, data verification and data integrity requirements with Huppert. Iacometti continues to write and test the PACFIN summarization program.

WPACFIN Update

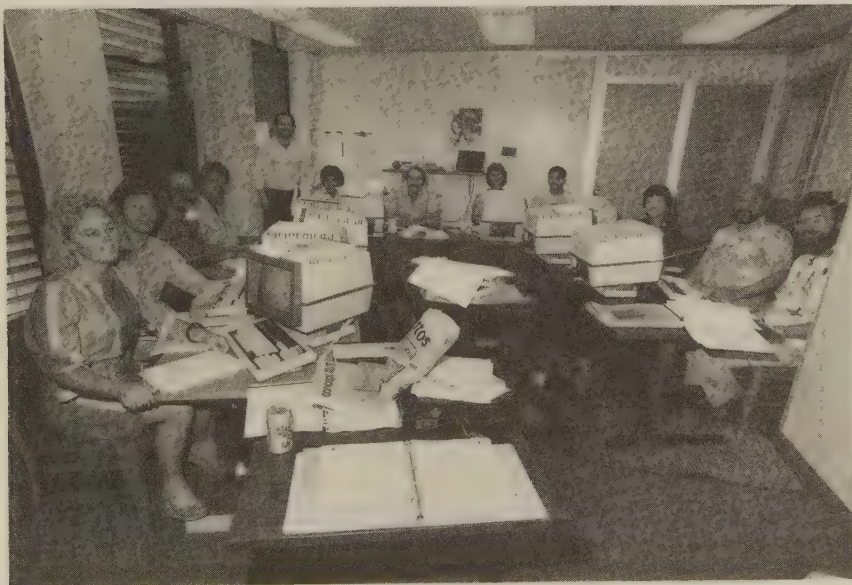
In related Western Pacific Fishery Information Network (WPACFIN) activities, Hamm and Kassman distributed WPACFIN Technical Memorandum No. 9 concerning documentation of DB Master data bases and processing activities; modified a computer program to run on the Apple microcomputer that lists Applesoft BASIC programs in a format suitable for documentation and makes debugging easier; and received inquiries for assistance in establishing fishery data collecting and processing systems from YAP, Ponape, and the Marshall Islands.

ADP Procurement Activities

The Molecular Super-microcomputer 15-8 (15 megabyte hard disk, 8 application processor system) for NOAA Ship David Starr Jordan was delivered to the Center during the first week of October. Since General Data

Corporation, winner of the bid to provide the micro, did not also provide for the installation and testing of this unit, Jack Brown, Electronics Engineer, installed and tested the Super-microcomputer 15-8 system. The Super-microcomputer will undergo its first sea trial during the anchovy recruitment cruise on the Jordan, November 14-19.

The Molecular Super-microcomputer 32X for the La Jolla Laboratory, scheduled for delivery on October 26, was delivered October 31. The system was installed and tested during the first day of the week's training session. The SWFC has contracted with Severn Companies, Inc. for the course on the Molecular Super-microcomputer 32X System Configuration and Management. The 5-day session, held October 31 through November 4, was conducted by company representative Stan Dvoskin. Attending were Fletcher Riggs, Honolulu Laboratory; Nancy Wiley and Fred Plotkin, Tiburon Laboratory; Don Smith and Wayne Ellis, David Starr Jordan; Al Coan, La Jolla Laboratory-OFRD; Rich Charter, La Jolla Laboratory-CFRD; and Jack Brown, Dorothy Roll, Robert Nydam, and Susan Iacometti, La Jolla Laboratory-Data Management/ADP Operations. Iacometti, Computer Systems Programmer, with Rich Charter's assistance designed and set up the work space for the training session in the ADP Operations Users room. With 10 video screens on work tables connected to a U, the Users Room was effectively utilized as a training area. Each of the video screens was connected to an individual application processor on the Super-microcomputer 32X unit which was located in the middle of the U-shape. This permitted each trainee to attend simultaneous hands-on training sessions on the Molecular Super-Microcomputer 32X.



From left to right: Susan Iacometti and Robert Nydam (La Jolla), Don Smith and Wayne Ellis (David Starr Jordan), Stan Dvoskin (instructor), Al Coan, and Rich Charter (La Jolla), Nancy Wiley, Fred Plotkin (Tiburon), Dorothy Roll and Jack Brown (La Jolla), and Fletcher Riggs (Honolulu).

Training Sessions Scheduled for Administrative and Secretarial Staff

Dorothy Roll and Susan Iacometti met with members of the Center Director's staff on October 6. to present an overview of the Super-microcomputer Molecular 32X. They discussed the implementation schedule for the word processing system and the planned WORDSTAR training sessions which Iacometti will conduct for the ADP staff and the secretarial staff at the Center.

* * * * *

Robert Nydam, Computer Programmer Analyst, completed generating the year-end FY 1983 financial report for the Southwest Fisheries Center. With Robert Bistodeau, Computer Technician, he is continuing to develop software for the Financial Reporting System to be implemented on the Super-microcomputer.

Fish 'N' Chips Newsletter Issued

Dorothy Roll, Computer Systems Analyst, completed the second issue of the SWFC micro newsletter, titled FISH 'N' CHIPS. The newsletter, published periodically for the purpose of disseminating information on hardware and software, has been distributed to the staff in all SWFC Laboratories and computer users in the Southwest Region. Of special note in this issue is the description of the laboratories' Super-microcomputer 32X (La Jolla, Honolulu, and Tiburon) and the Super-microcomputer 15-8 for the David Starr Jordan. Users were informed there would be a 3 month implementation period for the La Jolla Laboratory's system in order to insure a reliable operational system manned by competent consultants when the staff users are brought onboard.

MISCELLANEOUS

HONORS AND AWARDS

Honolulu Laboratory

Richard S. Shomura, Director of the Southwest Fisheries Center's Honolulu Laboratory since 1973, received NOAA's Administrator's Award from Dr. John V. Byrne, Administrator of NOAA, in ceremonies held on October 7, 1983 in Washington, DC.



Richard Shomura, Director of the SWFC's Honolulu Laboratory is shown receiving the Administrator's Award from Dr. John V. Byrne, Administrator of NOAA, while William G. Gordon, Assistant Administrator for Fisheries looks on.

Shomura was cited for his efforts in bringing together a diverse group of scientists at a symposium held at the University of Hawaii last May. The scientists shared results of studies on the fish and wildlife of a group of islands and atolls extending over a thousand miles northwest of Hawaii. These islands and atolls, especially Midway, have strategic military importance, and harbor some of the world's most important seabird colonies and many commercially and recreationally valuable fish and shellfish. These islands are also the terrestrial habitat of the endangered Hawaiian monk seal and the green sea turtles.

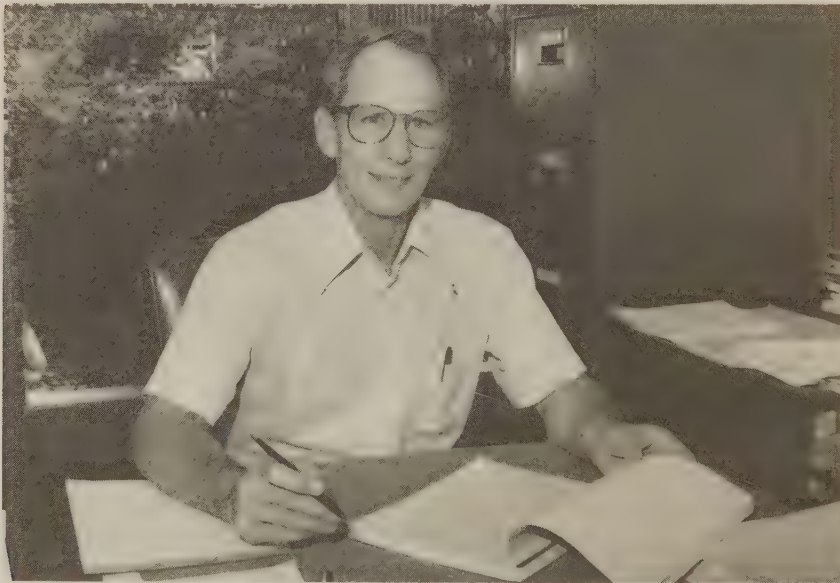
Shomura was also commended for his initiative and leadership in dealing with problems of assessing fishery resources and improving fishery management in underdeveloped areas of the Pacific.

Shomura holds a Master of Science in zoology from the University of Hawaii and is the only locally born person to hold the laboratory director's position since the Honolulu Laboratory was established.

The Administrator's Award presented to Shomura consists of a plaque and stipend of \$2,000. This award is given annually to a maximum of 10 NOAA employees (NOAA employs almost 15,000 persons) who have made significant contributions to NOAA's programs.

La Jolla Laboratory

Fisheries Executive Officer Named Employee of the Year



A veteran of 31 years of government service, Benjamin F. Remington, Executive Officer for the Southwest Fisheries Center, a key fisheries research facility in the National Marine Fisheries Service (NMFS) was named recently as the NMFS Employee of the Year in the Management/Supervisory category by William Gordon, Assistant Administrator for Fisheries in Washington, DC. Remington is responsible for the financial management and administration of the Southwest Fisheries Center's four laboratories located in Honolulu, Hawaii, La Jolla, Monterey, and Tiburon, California, which carry out fisheries research programs on the tunas of the Atlantic and Pacific Oceans, Fisheries of the California Current and the Pacific coastal zone, porpoises of the eastern tropical Pacific, and ocean climatology.

In addition to his originating and evolving an internal financial reporting system which has saved the Center many thousands of dollars, Remington was cited for his role in federal programs for disadvantaged young people and advocacy of the NOAA Junior Fellowship program at the La Jolla Laboratory. He was also instrumental in establishing the Junior Fellowship program at the Center's Honolulu and Tiburon Laboratories.

Remington is a native of Alexandria, Virginia. He graduated from the University of Colorado in Boulder, Colorado, with a degree in Business Administration. His years of government service include 4 years in the Air Force in meteorology and 4 years as a civilian with the Antarctic research project of the Weather Bureau, wintering over at Little America IV and the South Pole. Remington transferred to the Center in 1974 from a position as Financial Analyst with the NMFS Plans and Policy Development staff in Washington, DC.

NMFS Scientist is Recipient of Canadian Marine Science Award



Reuben Lasker, NOAA Gold Medal Winner and Chief of the Coastal Fisheries Resources Division at the Southwest Fisheries Center, added to his list of honors with the announcement that he is the 1983 recipient of the A.G. Huntsman Award for excellence in marine science. Dr. Lasker was notified of the honor by the Huntsman Award Committee at the Bedford Institute of Oceanography (BIO) in Dartmouth, Nova Scotia, Canada.

The Huntsman Award was established in 1980 by BIO and is presented annually in one of the three divisions of marine science--biological oceanography, physical/chemical oceanography and marine geoscience. It recognizes excellence of research, outstanding contributions to science, and influence on the course of marine scientific thought. Recipients are honored not only for their caliber of science and scientific thought, but also for their impact and influence on the future of oceanography.

In a prepared statement the Award Committee stated, "Dr. Lasker is a highly regarded teacher and researcher in the field of biological oceanography who has had a profound influence on our understanding of the nutrition, biochemistry, and general physiology of marine organisms. He has pursued a life-time search for the causes of fluctuations in the abundance of fish populations, concentrating on the sardines and anchovies of the California Current, as models of fish-stocks everywhere. Starting from laboratory studies on the bioenergetics of eggs and larvae in the early 60's, he developed a mechanism for spawning anchovies on demand in the laboratory. This significant break-through in the supply of research material enabled him to progress rapidly through studies of larval feeding behavior to critical experiments at sea for determining the oceanographic conditions necessary to establish sufficient food conditions."

The work by Dr. Lasker and his colleagues at the La Jolla Laboratory the awards committee concluded, "is a most elegant combination of laboratory physiology and biological oceanographic field work. . . (which) culminated in the late 1970's with a first demonstration of how good and poor year-classes of fish, in this case, anchovy, might be formed that has resolved old questions, and had led to a worldwide resurgence of research in this important field."

Dr. Lasker will receive the specially designed and engraved sterling silver medal at ceremonies on November 9 in the auditorium at BIO from the President of the Royal Society of Canada, Professor Marc-Adelard Tremblay. Following the ceremony the medalist will present a distinguished lecture. The Huntsman Award is supported jointly by the Departments of Fisheries and Oceans, Energy, Mines and Resources, the East Coast Petroleum Operators Association, and the Provincial Department of Fisheries in Canada.

Dr. Lasker is a long-time federal employee who joined the fisheries service in 1958 as a research physiologist. He is married to the former Caroline Hayman and has two grown children.

PRESS RELEASES

Honolulu Laboratory

October 25 -"Honolulu Fishery Administrator Wins NOAA Award.

La Jolla Laboratory

"Andrew Bakun selected as Chief, Pacific Environmental Group."

"NMFS Scientist is Recipient of Canadian Marine Science Award."

"Fisheries Executive Officer Named NMFS Employee of the Year."

SEMINARS

La Jolla Laboratory

Chaired by Oceanographer Larry Eber, the regularly scheduled seminar series in October included the following presentations:

October 4 - Dr. Paul E. Smith, Southwest Fisheries Center who spoke on "Year class strength and survival of clupeoid fishes in the first year of life.

18 - Dr. Vance McClure discussed "Residence time of anthropogenic organics in the North Pacific mixed layer--70 years?

* * * * *

On October 19, Dr. Osamu Fukuhara of the Nansei Regional Fisheries Research Laboratory in Hiroshima, Japan, visiting the Center, presented a discussion of the biology and mariculture of the red sea bream, Pagrus major and the Japanese anchovy, Engraulis japonica.

* * * * *

Sharon Lundin, Chief, Employee Services Branch, Personnel Division, WASC, Seattle, Washington, visited the Center on October 25 and presented a seminar on the topics, Merit Pay Plans, General Workforce Performance Appraisal System, awards and training.

PUBLIC AFFAIRS

Honolulu Laboratory

- October 4 - Director Richard S. Shomura served as a panelist, discussing "Federal-State Agency and University Research: A Joint Effort in Addressing Societal Needs," at the University of Hawaii's celebration of National Higher Education Week held at the Hawaii Institute of Geophysics, UH. Other panelists were: Dr. Robert Shallenberger, USFWS, Dr. Richard Grigg and Dr. Edward Laws, UH.

Tiburon Laboratory

- 29 - The research of the Tiburon Laboratory was featured in a special presentation of KRON-TV, Channel 4, San Francisco, on Saturday, October 29. "Weekend Extra" focused on striped bass and San Francisco Bay and included an interview with Dr. Jeannette Whipple, Chief of the Physiological Ecology Investigation.

MEETINGS AND TRAVEL

Honolulu Laboratory

- October 5-7 - Richard Shomura traveled to California to meet with SWFC personnel and to Washington, DC, to attend the NOAA Administrator's Awards Ceremony.
- 14 - Richard Shomura organized an informal meeting of researchers from the UH, Hawaii Division of Aquatic Resources, and the Honolulu Laboratory. Informal presentations were made by Honolulu Laboratory program leaders and the other participants on their respective research programs. The purpose of the meeting was to better acquaint researchers from these agencies with each other to encourage closer working relations.
- 18 - Richard Shomura and Mary Lynne Godfrey attended the Combined Federal Campaign kick-off luncheon at the Hale Koa Hotel.

La Jolla Laboratory

- October 2-7 - Dr. Barrett traveled to Woods Hole, Massachusetts to attend the Northeast Center's program reviews and to Washington, DC, to attend the NOAA Awards Ceremony.
- 6 - Dr. Gary Sakagawa attended the meeting of IATTC Advisors in SWFC auditorium.
- 10-12 - Mike Laurs, Paul Smith, Larry Eber, Ken Bliss, and Paul Fiedler traveled to Lake Arrowhead, California, to attend the 30th Eastern Pacific Oceanic Conference.
- 11-13 - SWFC/SWR economists (Dan Huppert, Cindy Thomson, Sam Herrick, Sam Pooley, Chuck Korson, Wes Silverthorne and Ed Ueber) met in La Jolla to complete allocation of FY 84 contract funds to begin work on a longer-term economics research plan.
- 12-14 - Drs. Gary Sakagawa and Norman Bartoo traveled to Washington, DC, to participate in a meeting of the Advisory Committee to the U.S. Section of the International Commission for the Conservation of Atlantic Tunas.
- 12-16 - Purchasing agent Bobbi Watkins was in Seattle, Washington, to attend a GSA training course on federal acquisitions regulations.
- 14 - Ron Lynn traveled to Los Angeles, California, to attend a Dynalysis Workshop.
- 17-21 - Dr. Doug. DeMaster traveled to Anchorage, Alaska, to present a paper and to participate in a Bering Sea Workshop on marine mammal/fisheries interactions.
- 17-24 - Dr. Reuben Lasker traveled to Taipei, Taiwan, under the auspices of the National Science Foundation to attend a meeting with Taiwanese scientists to discuss the future of marine science in Taiwan.
- 18-21 - Drs. Barrett and Sakagawa were in Ottawa, Canada, to attend the 41st meeting of the Inter-American Tropical Tuna Commission.
- 20-24 - Mark Lowry traveled to Pt. Mugu, California, to attend the Mugu Lagoon/San Nicolas Island Ecological Research Symposium and to San Nicolas Island to conduct sea lion census and collect scats.

24-27 - John Carr was in Seattle, Washington, to attend an NMFS Vessel Committee meeting.

- Izadore Barrett, Reuben Lasker, Mike Laurs, John Hunter, Ron Lynn, Ken Bliss, Alec MacCall, Rick Methot, John Butler, Paul Fiedler, Eric Lynn, Chuck Kokes, Victor Gorospe, and David Ambrose traveled to Idyllwild, California, to attend/participate in the 1983 annual CalCOFI Conference.

24-30 - Dorothy Roll was in Woods Hole, Massachusetts, to attend the National Data Management Committee meeting.

October 29- - Drs. Norm Bartoo and Pierre Kleiber traveled to Madrid,
November 9 Spain, to attend and participate in the Scientific Committee on Research and Statistics meeting at ICCAT.

October 29- - Dr. Sakagawa traveled to Madrid, Spain, to attend and
November 16 participate in the SCRS meeting and also to act as advisor to U.S. Commissioners.

October 31- - Dr. Barrett was in Honolulu, Hawaii, for consultations
November 2 with the Director, Honolulu Laboratory, and with the Director of the Hawaiian Division of Aquatic Resources.

Pacific Environmental Group

October 9-12 - Douglas McLain attended the EPOC Conference at Lake Arrowhead; he presented a paper on the 1982-83 El Niño event.

17-19 - Rosemary Troian traveled to SWFC, La Jolla, to receive training on administrative procedures.

20-21 - Andrew Bakun was an invited participant in discussions of impacts of global atmosphere/ocean teleconnections, at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado.

24-28 - Dick Parrish attended the CalCOFI Meeting at Idyllwild, California; he presented two papers: (1) evidence for fall spawning stock, and (2) California Department of Fish and Game - National Marine Fisheries Service Wetfish Data Bases (co-authored by Donna Mallicoate).

Tiburon Laboratory

- October 5-12 - Sus Kato traveled to Southern California to obtain information for a talk given at Fish Expo in Seattle, Washington, on the California sea urchin fishery. He also discussed various cooperative projects with fishermen in Santa Barbara, Ventura, Avila Beach, and San Pedro.
- 12-14 - Ed Ueber traveled to La Jolla to attend Southwest Region and Southwest Center meetings on economic research needs.
- 17-18 - Pete Adams, Tony Chess, Tina Echeverria, Ted Hobson, and Susan Smith traveled to Monterey, California, to meet with members of the Pacific Environmental Group for a review of coastal oceanography.
- 18-19 - Sennen Salapare traveled to Fort Bragg to retrieve experimental fishing gear loaned to cooperating fishermen. He also conferred with biologists of California Department of Fish and Game and with a gear manufacturer.
- 20-26 - Dr. Bill Lenarz attended meetings of the Groundfish Management Team in Seattle and Portland.
- 25-28 - Sus Kato traveled to Seattle to participate in the Inshore Fisheries Conference Workshop held at Fish Expo. His presentation was on "Meeting Export Standards for Sea Urchin Roe." While in Seattle, Kato visited the Fisheries Utilization Division of the Northwest and Alaska Fisheries Center, as well as several fish exporters.
- Ed Ueber traveled to Nanaimo, B.C., and to Seattle to attend the Western Association for the Valuation of Ecosystems meeting and Fish Expo.

VISITORS

Honolulu Laboratory

- October 6 - Dr. Sann Aung, Fishery Scientist from Burma, arrived for 2 months of training at the Honolulu Laboratory. He is interested in population dynamics, data acquisition, and microcomputer processing of fishery data.

- 19 - Richard Beales, Fishery Adviser, Fiji, visited Richard Shomura.
- 25 - Katsuhiro Kudo, Chief of Fisheries Resource Section, Fisheries Experimental Station, Department of Forestry and Fisheries, Oita Prefecture, Japan, visited Richard Shomura. Kudo was briefed on the Honolulu Laboratory's research program and given tours to various points of interest during his stay in Honolulu between 25 and 30 October.

La Jolla Laboratory

- October 6 - Don Norman, Inspector General, Dept. of Commerce.
- 13 - Mr. Bill Sullivan, Office of the Assistant Administrator for Fisheries Resources.
- 18 - Dr. Katsuhiro Kudo, Director of Resource Division, Oita Prefecture, Japan.
 - Rosemary Troian, PEG, Monterey, California.
 - (Other visitors as noted in text.)

Pacific Environmental Group

- October 17 - Alan Grover, California Department of Fish and Game, Long Beach.
- 18 - Ted Hobson, Tina Echeverria, Pete Adams, Susan Smith, Tony Chess, all of the Tiburon Laboratory.
- 21 - Dr. Jean-Claude LeGuen, ORSTOM, Noumea.

Tiburon Laboratory

- October 13 - K. Takayama, Weston International, South San Francisco.
- 19 - Jack Brown, NMFS, La Jolla.
- 19-21 - Charles Chavez, Eddie Tate, and Stanley Fillips, engineers from WASC's Facility Engineering and Management Division, conducted a site study at the request of Center Director Barrett. The study is to produce estimates of what would be required to upgrade or replace the Tiburon Laboratory physical facilities.

- 21 - K. Takayama, Weston International, South San Francisco.
- 28 - Bruce Wyatt, University of California Sea Grant, Davis.

PERSONNEL ACTIONS

Honolulu Laboratory

- October 1 - Wesley K. Higuchi, Mathematics Aid - Conversion to Excepted Appointment.
- 2 - Marlene W. L. Dung, Computer Clerk - Conversion to Excepted Appointment.
- Timothy Gerrodette, Fishery Biologist (Research) - 2-yr Term Appointment.
- 4 - Michael P. Seki, Biological Technician (Fisheries) - Extension of Temporary Appointment.
- 11 - Alan R. Everson, Biological Technician (Fisheries) - Extension of Temporary Appointment.
- Thea C. Johanos, Wildlife Biologist - Return to Duty.
- Nathaniel T. Shippen, Biological Technician (Fisheries) Termination--Expiration of Appointment.
- 14 - Dung A. Branton, Computer Programmer - Resignation.
- 30 - John A. Loux, biological Aid - Extension of Intermittent Appointment.
- 31 - Louise F. Lembeck, Editorial Clerk (typing) - Termination.

La Jolla Laboratory

- October 1 - John Hedgepeth, Biological Technician - Extension of Full-Time (Temp.) Appointment.
- Joel Strickland, Biological Technician - Extension of Temporary (Intermittent) Appointment.
- Jay Walker, Computer Systems Programmer - Extension of Appointment.

- Eugene Sibbald, Computer Systems Programmer - Extension of Appointment.
- 2 - Robert Pitman, Biological Technician - Entered on Duty.
- Kathleen Waldron, Biological Aid - Change of Schedule.
- Rich Charter, Computer Specialist - Detail NTE 120 days.
- 7 - Lisa Fern, Biological Technician - Resignation.
- 16 - John Hedgepeth, Fishery Biologist (Temp.) - Entered on Duty.
- Jay Barlow, Operations Research Analyst (Permanent) - Entered on Duty.
- Dimitry Abramenkoff, Biological Technician - Promotion.
- 18 - Morgan Busby, Biological Aid, Extension of Appointment.
- 19 - Gary Hunt, Biological Aid - Extension of Appointment.
- 24 - Owen Stiles, Cash and Attendance Clerk - Resignation Effective COB 12/9/83.

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